

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 6,893,617 B2
APPLICATION NO. : 09/881277
DATED : May 17, 2005
INVENTOR(S) : Robert X. Li et al.


Page 1 of 9

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Delete all of the drawing figures contained on sheets 1 of 17 through 17 of 17 and the title page, as shown inclusive, and replace them with substitute sheets 1 of 7 through 7 of 7, inclusive, containing figures 1-11 and title page.

Signed and Sealed this

Thirty-first Day of July, 2007

A handwritten signature in black ink, reading "Jon W. Dudas". The signature is stylized, with a large loop for the "J" and a cursive "Dudas".

JON W. DUDAS
Director of the United States Patent and Trademark Office

(12) **United States Patent**
Li et al.

(10) Patent No.: **US 6,893,617 B2**
(45) Date of Patent: **May 17, 2005**

(54) **APPARATUS AND METHOD FOR
RETENTION OF NON-THERMAL PLASMA
REACTOR**

(75) Inventors: Robert X. Li, Grand Blanc, MI (US);
Michael R. Foster, Columbusville, MI
(US); David E. Nelson, Waterford, MI
(US); Alan G. Turek, Mayville, MI
(US)

(73) Assignee: Delphi Technologies, Inc., Troy, MI
(US)

(*) Notice: Subject to any disclaimer, the term of this
patent is extended or adjusted under 35
U.S.C. 154(b) by 740 days.

(21) Appl. No.: 09/881,277

(22) Filed: Jun. 14, 2001

(65) Prior Publication Data

US 2002/0192127 A1 Dec. 19, 2002

(51) Int. Cl.⁷ B01J 19/08

(52) U.S. Cl. 422/186.04; 422/186.04

(58) Field of Search 422/186.04

(56) References Cited

U.S. PATENT DOCUMENTS

3,450,617 A	6/1969	Helund	
3,541,379 A	11/1970	Holden	
3,979,193 A	9/1976	Südk	
4,232,228 A	11/1980	Tanaka et al.	422/186.2
4,695,358 A	9/1987	Mizuno et al.	204/174
4,795,617 A	1/1989	O'Hare	422/186.15

(Continued)

FOREIGN PATENT DOCUMENTS

CN	1027828 C	1/1995
DE	3708508	3/1987
EP	0043477 A2	6/1981
EP	0585047 A2	8/1993
EP	0840838 B1	7/1996

(Continued)

OTHER PUBLICATIONS

Louis A. Rosocha; Los Alamos National Laboratory; *Non-thermal Plasma Applications to Pollution Control and Environmental Remediation*; First International Conference on Advanced Oxidation Technologies for Water and Air Remediation; London, Ontario, Canada, Jun. 25-30, 1994.

(Continued)

Primary Examiner—Kishor Mayekar

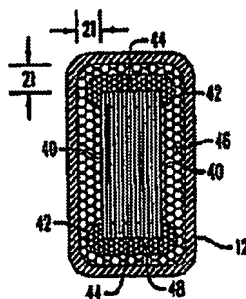
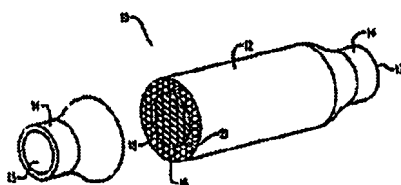
(74) Attorney, Agent, or Firm—Paul L. Marshall

(57)

ABSTRACT

A non-thermal plasma reactor is provided. The reactor includes a plasma-generating substrate, a housing, a voltage supplied to the plasma-generating substrate, and a retention material. The plasma-generating substrate has one or more flow paths for an exhaust gas. The plasma-generating substrate includes at least one weak area and at least one strong area. The housing has an inlet opening and an outlet opening. The voltage is supplied to the plasma-generating substrate for generating a plasma field. The retention material retains the plasma-generating substrate in the housing such that the one or more flow paths are in fluid communication with the inlet opening and the outlet opening. The retention material is configured to provide a higher retention force to the at least one strong area and a lower retention force to the at least one weak area.

17 Claims, 17 Drawing Sheets



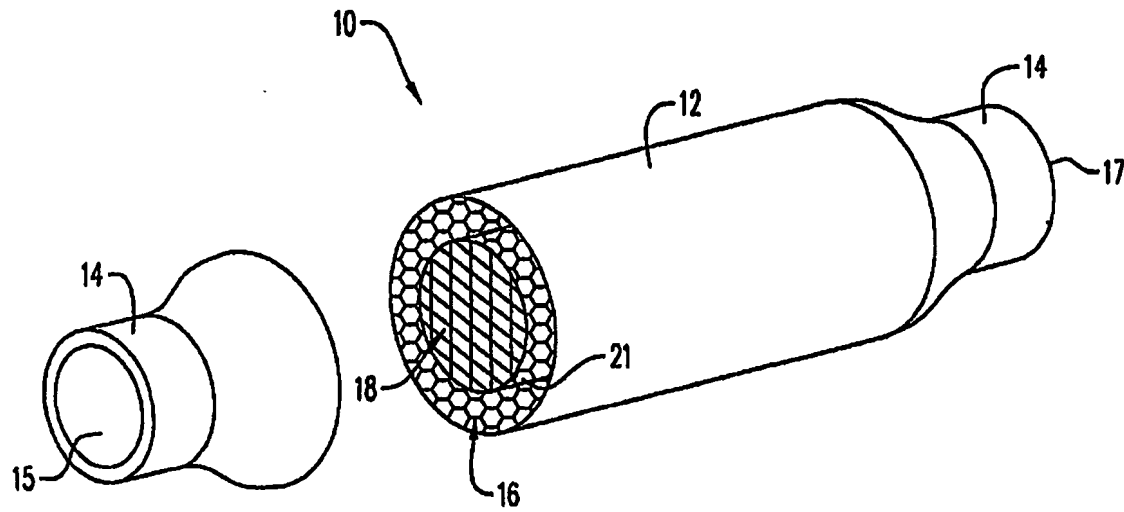


FIG. 1

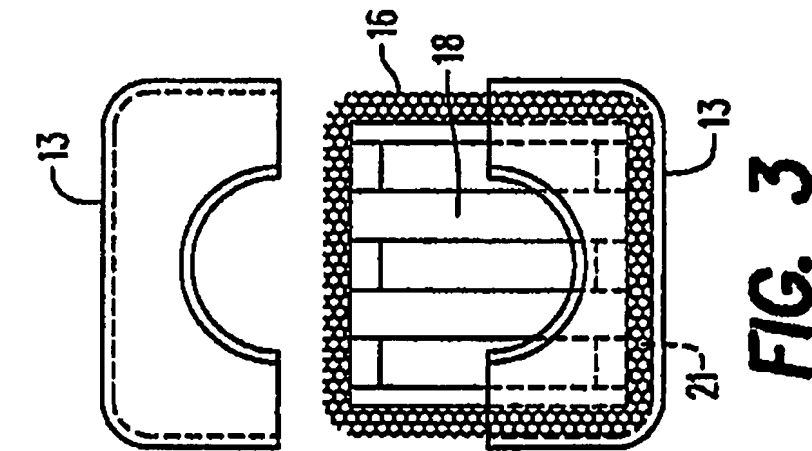


FIG. 3

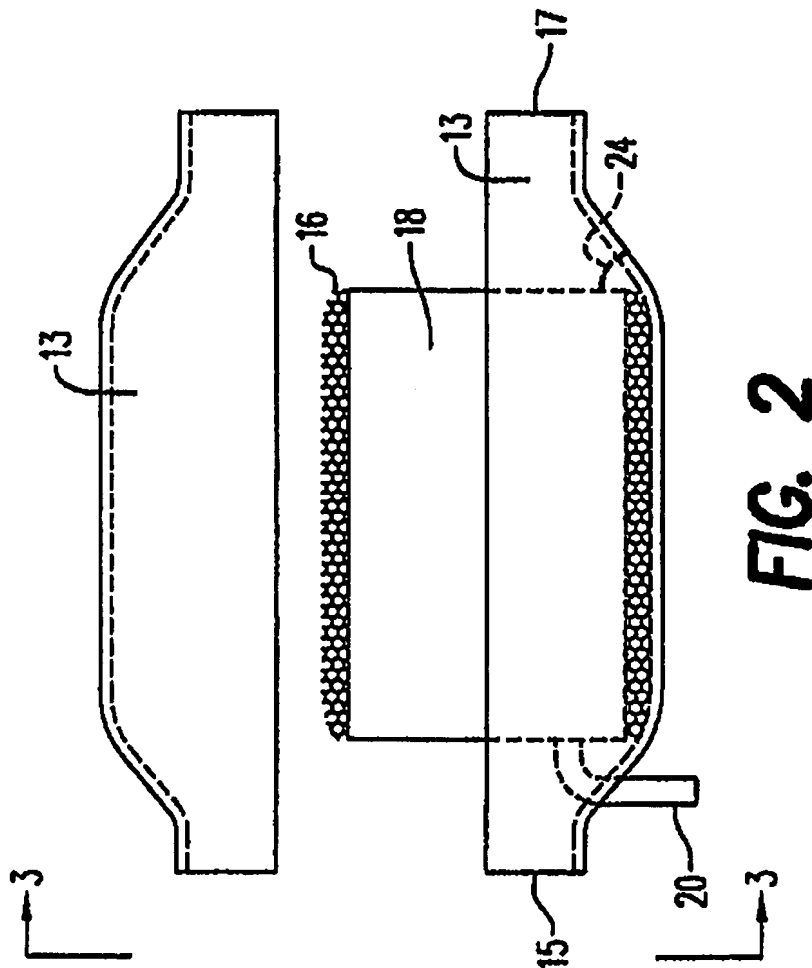
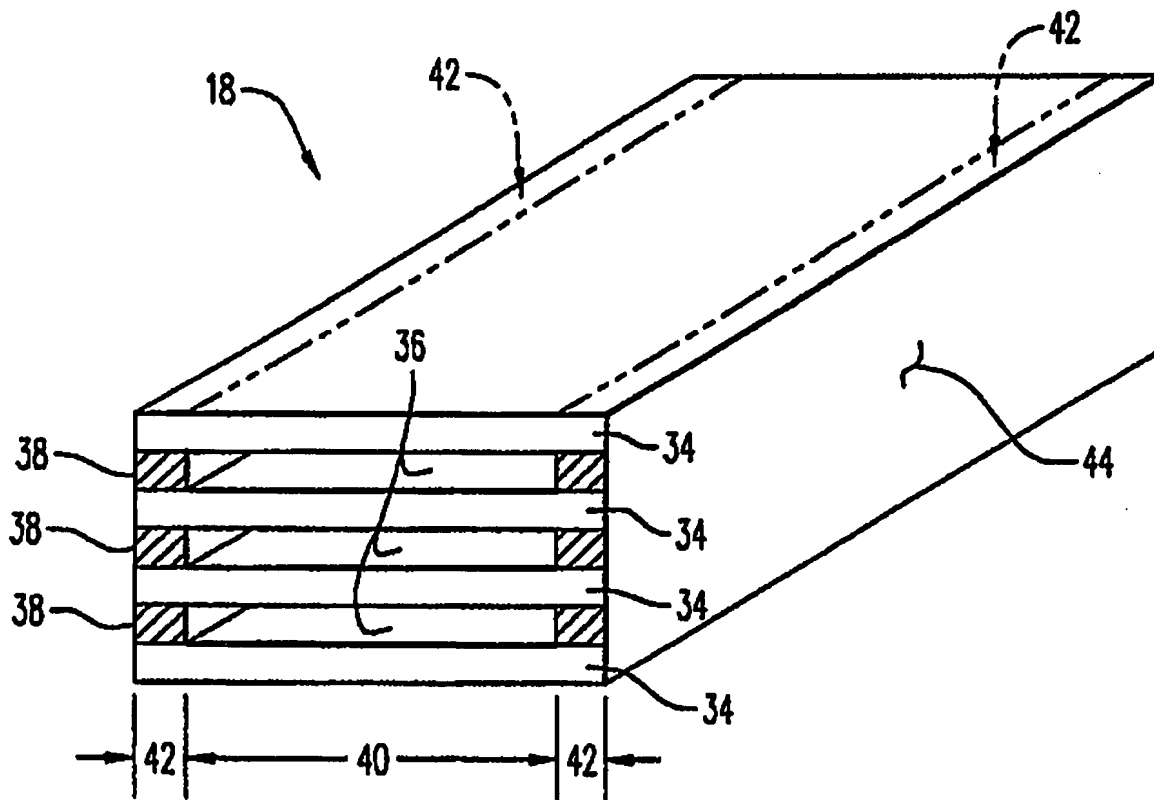
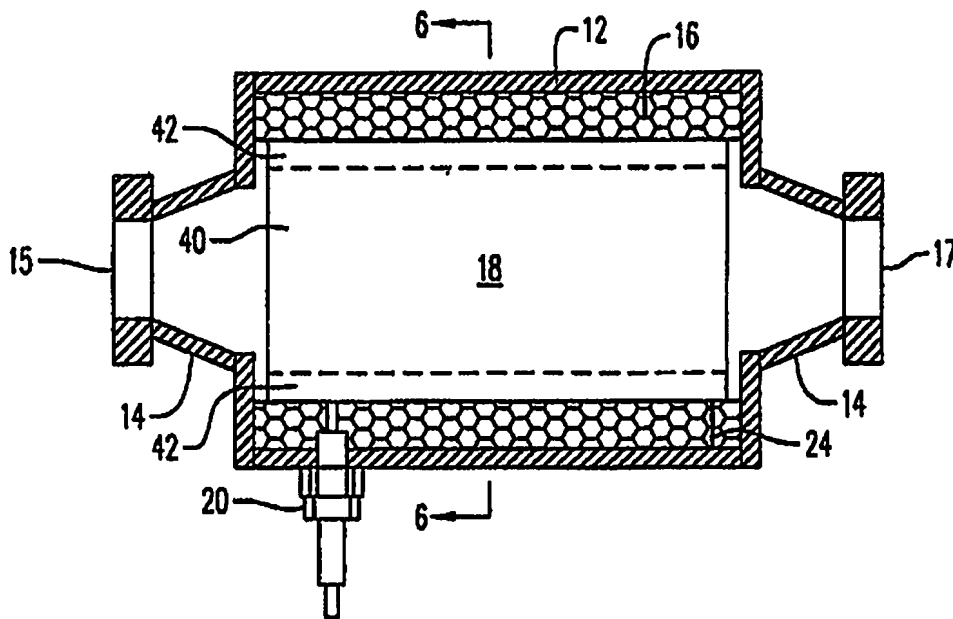
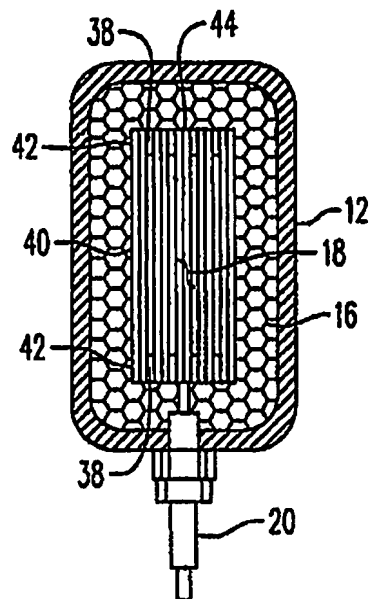
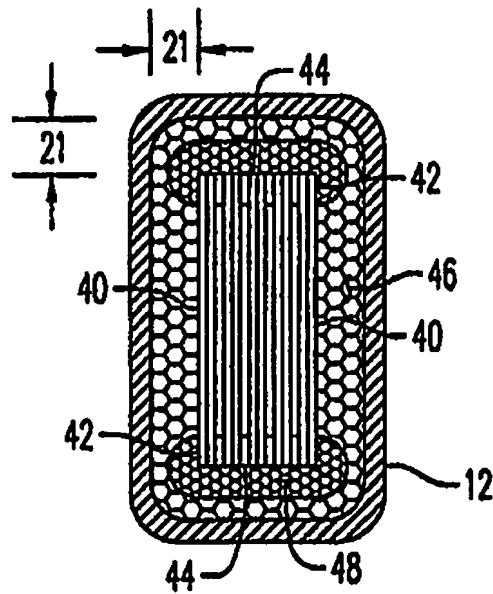
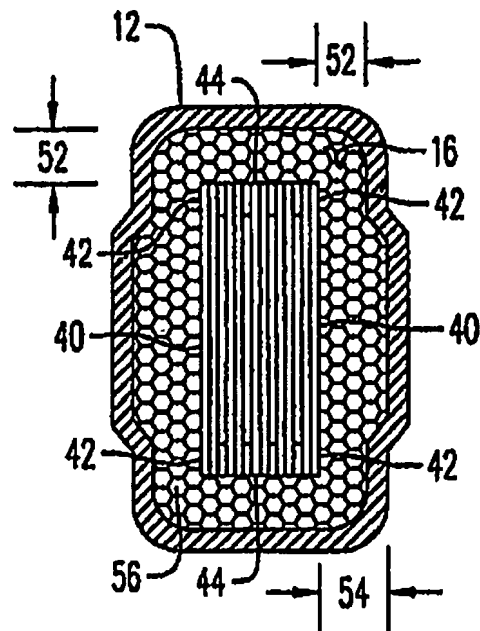
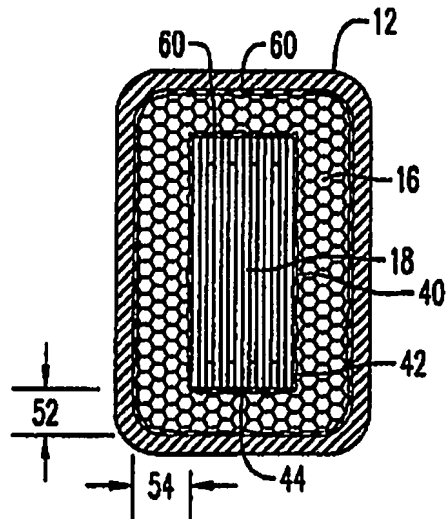
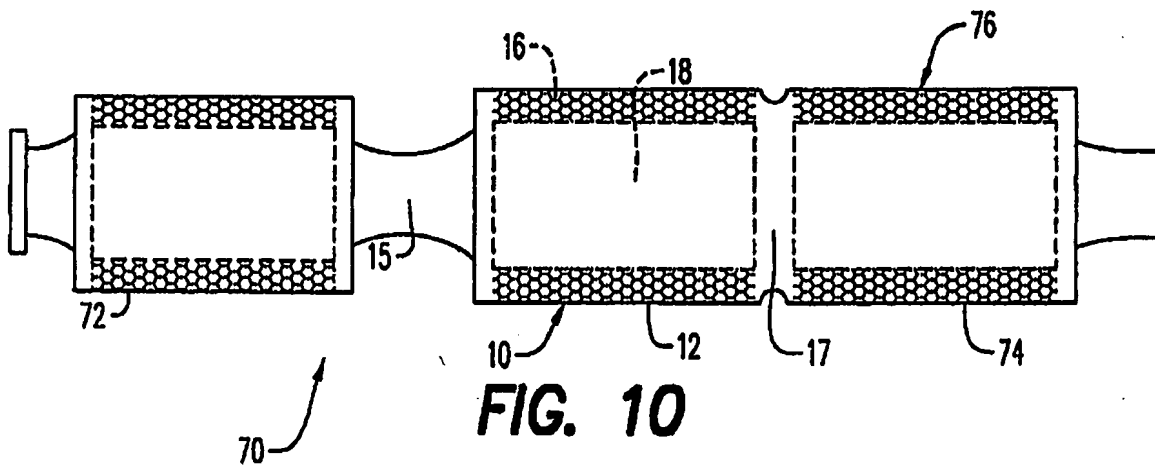


FIG. 2

**FIG. 4**

**FIG. 5****FIG. 6**

**FIG. 7****FIG. 8**

**FIG. 9****FIG. 10**

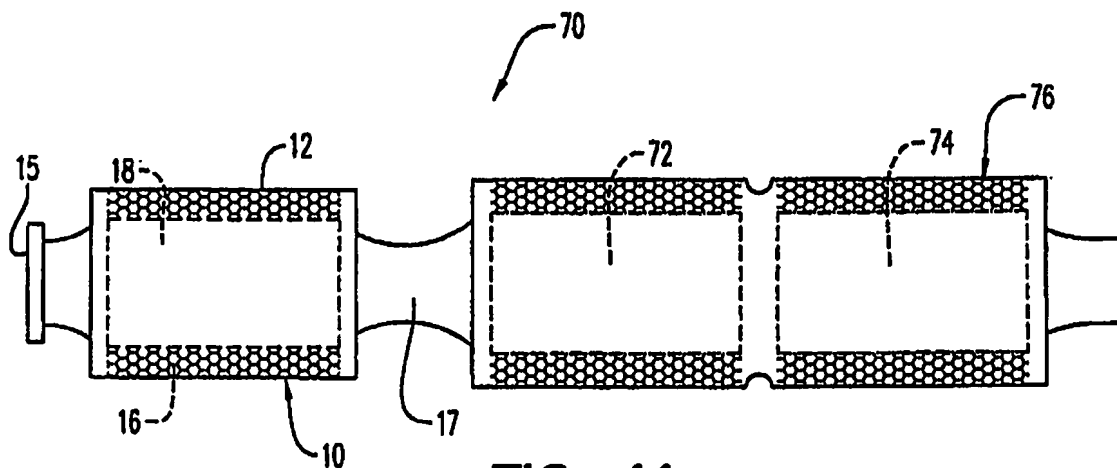


FIG. 11